

REMARKS

The proposed additional Fig. 12 has been disapproved because it allegedly introduces new matter into the specification. All references to Fig. 12 in the amendments to the specification filed on May 28, 2003 have been deleted.

The Examiner has suggested to submit drawings, like Fig. 2, in association with both cross sectional views of the disclosed photo-electric conversion units and the vertical charge transfer units, in page 3, lines 5-8 of the Office Action mailed on January 28, 2003. Further, the Examiner has suggested to submit timing diagrams modeled after Figs. 5A-5D, in page 3, lines 16-17, of the Final Office Action, mailed on July 18, 2003.

However, claim 1 of the present application is directed to "said electrical potential barrier being maintained between said OFD structure and each of said photo-electric conversion units", and is not directed to an electric potential barrier being maintained between the vertical charge transfer unit and the photo-electric conversion unit.

Further, claims 2, 5, 6, 9 and 10 of the present application are also not directed to an electric potential barrier being maintained between the vertical charge transfer unit and the photo-electric conversion unit.

Still further, Figs. 1 and 2 of the present application show the electric potential barrier being maintained between a vertical OFD structure and each of photo-electric conversion units in the first mode of embodiment of the present invention. Figs. 5A to 5D of the present application show the electric potential barrier being maintained between a horizontal OFD structure and each of photo-electric conversion units in the second mode of embodiment of the present invention. That is, Figs. 1, 2 and 5A to 5D show how and which potential barrier is manipulated.

On the other hand, an electric potential applied in the signal read-out portion is cited in claims 3, 4, 7, 8, 11 and 12 of the present application. The electric potential applied in the signal read-out portion causes an electric potential barrier to be maintained between the vertical charge transfer unit and the photo-electric conversion unit. Therefore, Applicant has cancelled claims 3, 4, 7, 8, 11 and 12.

Further, 37 C.F.R. 1.83(a) provides that the drawing must show every feature of the invention specified in the claims. Consequently, it is respectfully submitted that timing diagrams modeled after Figs. 5A to 5D are unnecessary and the Examiner's objection to the drawings should be overcome by the cancellation of claims 3, 4, 7, 8, 11 and 12.

Claims 1, 2, 9, and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kawahara et al., U.S. Patent No. 4,696,021 in view of Applicant's admitted prior art. Claims 5 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kawahara et al., in view of Applicant's admitted prior art and Lee et al., U.S. Patent No. 5,903,021. Claims 3, 4, 11, and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kawahara et al., in view of Applicant's admitted prior art. Claims 7 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kawahara et al., in view of Applicant's admitted prior art and Lee et al.

Claim 1 provides that the electric potential barrier is maintained between the overflow drain (OFD) structure and each of the photo-electric conversion units and that the read-out procedures of outputting an image signal from all of the photo-electric conversion units comprises a step of raising up the electric potential barrier. The overflow control gate 4 in Kawahara et al., corresponds to the electric potential barrier between the overflow OFD structure and each of the photo-electric conversion units. Since that overflow control gate is arranged between the photodiode array 1 and the overflow drain 2 and is used for overflow potential

controlling purposes, (column 2, lines 22-24), the potential barrier under that overflow control gate 4 is never raised up in Figs. 4A to 4G. On the contrary, it is decreased.

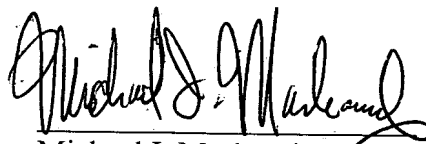
CLOSING

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that independent claim 1 is in condition for allowance, as well as those claims dependent therefrom. Passage of this case to allowance is earnestly solicited.

However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper, not fully covered by an enclosed check, may be charged on Deposit Account 50-1290.

Respectfully submitted,



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